

Claims

1. Heating device, in particular for a vehicle, comprising:
 - a burner means (42; 42a) for producing combustion heat,
 - a heat exchanger means (16; 16a) for transferring combustion heat produced in the burner means (42; 42a) to medium to be heated, wherein the heat exchanger means (16; 16a) has a first heat exchanger region (56; 56a) for transferring combustion heat to a first medium to be heated and a second heat exchange region (70; 70a) for transferring combustion heat to a second medium to be heated.
2. Heating device according to claim 1, wherein the first medium to be heated is a gaseous medium and the second medium to be heated is a liquid medium.
3. Heating device according to claim 1 or 2, wherein the heat exchanger means (16; 16a) has a heat exchanger body (40, 40a) with a combustion exhaust gas conducting space (44) provided therein for receiving combustion heat from the combustion exhaust gases flowing through the combustion exhaust gas conducting space (44).
4. Heating device according to claim 3, wherein the first heat exchanger region (56; 56a) has numerous heat transfer ribs (62; 62a) provided on the heat exchanger body (40; 40a) and respectively providing heat transfer surfaces (64; 64a).
5. Heating device according to claim 4, wherein the heat transfer ribs (62; 62a) are at least partially formed separately from the heat exchange body (40; 40a) and are in heat transfer connection with this.

6. Heating device according to one of claims 1-5, wherein the second heat exchanger region (70; 70a) has a flow duct means (72; 72a) for the second medium to be heated.
7. Heating device according to claim 6, wherein the flow duct means (72) includes a medium conducting channel (72) formed in the heat exchange body (40).
8. Heating device according to claim 7, wherein the medium conducting channel (72) includes numerous medium conducting channel regions.
9. Heating device according to claim 8, wherein at least a portion of the medium conducting channel sections is selectively releasable for through flow.
10. Heating device according to one of claims 7 - 9, wherein the medium conducting channel (72) extends in the heat exchange body (40) approximately parallel to the combustion exhaust gas conducting space (44).
11. Heating device according to claim 4 or one of claims 5 - 10, insofar as referred back to claim 4, wherein the flow conducting means (78a) includes at least one medium conducting duct (80a, 82a) running in the region of the heat transfer ribs (62a).
12. Heating device according to claim 11, wherein the at least one medium conducting duct (80a, 82a) passes through at least one portion of the heat transfer ribs (62a).
13. Heating device according to claim 12, wherein the at least one medium conducting duct (80a, 82a) passes plural times through at least one portion of the heat transfer ribs (62a).
14. Heating device according to one of claims 1 - 13, wherein it has a housing arrangement (30; 30a) conducting the first medium to be heated, the heat exchanger means (16; 16a) being arranged substantially in the housing means (30; 30a) and

the burner means (42; 42a) being arranged substantially outside the housing means (30; 30a).

15. Heating device according to one of claims 1-14, wherein none of the heat exchanger regions (56, 70; 56a, 70a) requires, for heating the medium to be heated therein, the medium to be heated in the other heat exchange region (70, 56; 70a, 56a).
16. Heating system for a vehicle, comprising a heating device (12; 12a) according to one of the foregoing claims, wherein an air conducting region supplies air to be heated and introduced into a vehicle interior to the first heat exchanger region (56; 56a) of the heat exchanger means (16; 16a) by means of a first forwarding means (18) as the first medium to be heated and a conditioning medium flow region (26) supplies conditioning means of a drive assembly (20) to the second heat exchange region (70; 70a) by means of a second forwarding means (28) as the second medium to be heated.

Amended Claims

[filed at the International Bureau on October 20, 2003, original claims 1-16 replaced by amended claims 1-10]

Claims

1. Heating device for a vehicle, comprising:
 - a burner means (42; 42a) for producing combustion heat,
 - a heat exchanger means (16; 16a) for transferring combustion heat produced in the burner means (42; 42a) to medium to be heated,wherein the heat exchanger means (16; 16a) has a first heat exchanger region (56; 56a) for transferring combustion heat to a gaseous first medium to be heated and a second heat exchange region (70; 70a) for transferring combustion heat to a liquid second medium to be heated,
wherein
the heat exchanger means (16; 16a) has a heat exchanger body (40, 40a) with a combustion exhaust gas conducting space (44) provided therein for receiving combustion heat from the combustion exhaust gases flowing through the combustion exhaust gas conducting space (44),
wherein furthermore
the first heat exchanger region (56; 56a) has numerous heat transfer ribs (62; 62a) provided on the heat exchanger body (40; 40a) and respectively providing heat transfer surfaces (64; 64a), and the second heat exchanger region (70; 70a) has a flow duct means (72, 72a) for the second medium to be heated,

the flow duct means (78a) includes at least one medium conducting duct (80a, 82a) running in the region of the heat transfer ribs (62a), and wherein the at least one medium conducting duct (80a, 82a) passes at least partially through at least a portion of the heat transfer ribs (62a).

2. Heating device according to claim 1, wherein the heat transfer ribs (62; 62a) are at least partially formed separately from the heat exchange body (40; 40a) and are in heat transfer connection with this.
3. Heating device according to claim 1 or 2, wherein the flow duct means (72) includes a medium conducting channel (72) formed in the heat exchange body (40).
4. Heating device according to claim 3, wherein the medium conducting channel (72) includes numerous medium conducting channel regions.
5. Heating device according to claim 4, wherein at least a portion of the medium conducting channel regions is selectively releasable for through flow.
6. Heating device according to one of claims 3 - 5, wherein the medium conducting channel (72) extends in the heat exchange body (40) approximately parallel to the combustion exhaust gas conducting space (44).
7. Heating device according to one of claims 1 - 6, wherein at least one medium conducting duct (80, 82a) passes plural times through at least a portion of the heat transfer ribs (62a).
8. Heating device according to one of claims 1 - 7, wherein it has a housing means (30; 30a) conducting the first medium to be heated, the heat exchanger means (16, 16a) being substantially arranged in the housing means (30, 30a) and the burner means (42; 42a) being substantially arranged outside the housing means (30; 30a).

9. Heating device according to one of claims 1 - 8, wherein none of the heat exchanger regions (56, 70; 56a, 70a) requires, for heating the medium to be heated therein, the medium to be heated in the other heat exchange region (70, 56; 70a, 56a).
10. Heating device for a vehicle, including a heating device (12, 12a) according to one of the foregoing claims, wherein an air flow region supplies air to be heated and introduced into a vehicle interior to the first heat exchanger region (56; 56a) of the heat exchanger means (16; 16a) by means of a first forwarding means (18) as the first medium to be heated and a conditioning medium flow region (26) supplies conditioning means of a drive assembly (20) to the second heat exchange region (70; 70a) by means of a second forwarding means (28) as the second medium to be heated.